DESIGN AND COMMUNICATION
(design a mousetrap)

Focus:

The general goal of this lab is twofold: to design a device which meets requirements, and to write a set of instructions from which the device may be constructed. The particular goal is to design a mousetrap.

Overview:

In addition to a thorough understanding of scientific principles, practical and useful designs and good communication skills are essential elements of engineering. It is quite likely that a group of people who have no comprehension of engineering fundamentals will not produce a good design. However, even an individual who is well-educated and trained in engineering could be the source of problems in the design process. Such an individual may come up with an elaborate and detailed design that is technically sound but is far more complex than necessary. (A general rule of thumb is "Simple is Better!") Another possibility is that the individual could have a great idea for a design but is unable to effectively and clearly communicate the idea to others. In either case, the idea may as well not exist. Thus, a successful engineer must develop proficient design and communication skills in addition to learning the science of engineering.

Procedure:

Design a mousetrap which is to be constructed of stiff paper, white glue, and rubberbands. Your trap need only capture the mouse--in this case a ping-pong ball. Your design should involve a triggering mechanism (that could be adorned with bait) which will spring the trap. If your design involves a closing door, make sure you provide a scheme for locking it once the trap is sprung. Testing will consist of slowly rolling a ping-pong ball toward the trigger. Access to the trap should be at ground level, i.e., no ramps. Your trap should capture the ball so that, if the trap is then shaken, the ball will not fall out.

When you have decided on a final design, produce a detailed set of instructions for the construction of the trap. These instructions should include dimensions and sketches to indicate how the paper should be cut, folded and glued. Also include final assembly instructions, i.e., how all the parts fit together. These instructions will be given to another team who will build the trap from your instructions.

Your success in this project will depend on two things: the other team's ability to produce a trap according to your instructions, and whether the trap works.